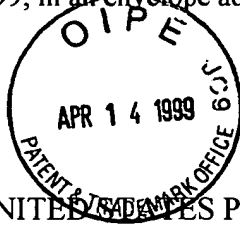



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Shaham Islam

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

2663/FBR

Applicant(s): Robert Linley Muir  
(Name of all Inventors)  
Serial No.: 09/238,535  
Filing Date: January 27, 1999  
(Month/Day/Year)  
Title: Multi-Platform Gaming Architecture  
(Title of Invention)

Examiner: Not Assigned

Group Art Unit: 2783

Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

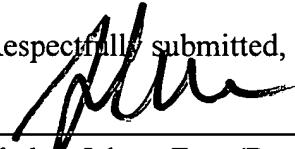
**SUBMISSION OF PRIORITY DOCUMENT**

Sir:

Enclosed is the priority document in this application, namely Australian Provision

Application No. PP 1499.

Respectfully submitted,

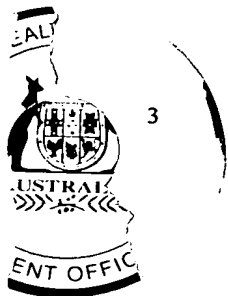
  
Shaham Islam, Esq. (Reg. No. 32,507)

Date: April 12, 1999  
FRIEDMAN SIEGELBAUM LLP  
Seven Becker Farm Road  
Roseland, NJ 07068  
(973) 992-1990 Ext. 191



**Patent Office  
Canberra**

I, KIM MARSHALL, MANAGER EXAMINATION SUPPORT AND SALES,  
hereby certify that the annexed is a true copy of the Provisional specification in  
connection with Application No. PP 1499 for a patent by ARISTOCRAT LEISURE  
INDUSTRIES PTY LTD filed on 27 January 1998.



WITNESS my hand this Twenty-first  
day of January 1999

A handwritten signature in cursive script, appearing to read "Kim Marshall".

**KIM MARSHALL**  
**MANAGER EXAMINATION SUPPORT AND**  
**SALES**

# **AUSTRALIA**

## **Patents Act 1990**

**ARISTOCRAT LEISURE INDUSTRIES PTY LTD**

### **PROVISIONAL SPECIFICATION**

*Invention Title:*

*Multi-platform gaming architecture*

The invention is described in the following statement:

## *Multi-Platform Gaming Architecture*

### **Introduction**

The combinations of a game describe the mathematical structure of the game and define all possible games, including the winning patterns and the payouts associated with each. From the combinations the game statistics are determined, including the theoretical return to the player.

As used in this document combinations, graphics and audio may contain both data and code.

### **Background of the Invention**

Currently a number of gaming architectures exist and are suitable for implementing games on a wide variety of platforms.

1. Standalone Electronic Gaming Machine (EGM). A standalone gaming machine containing all its functions within a secure environment. EGM's are commonly networked, primarily for data collection, bonusing and simple control.

2. Distributed gaming, such as Internet or In-room gaming (Hotel), separates the user interface (console) from the secure gaming server. High level communications reduces the need to send high bandwidth graphics data. A single server controls multiple consoles. Graphic and audio data necessary for game display are stored on the server and downloaded to the console as required for game display. To maintain security all functions that may effect game outcomes and accounting are performed on the server. A variation on this architecture is the distributed gaming accelerator, in which the gamble outcome decision logic is implemented at the console in a smartcard. Both server and console run combinations, generate/verify game outcomes and perform accounting.

3. TV allows the use of a television to play games. It separates the user interface (TV) from the rest of the gaming machine in a similar manner to the distributed gaming architecture, yet it could also be considered that a traditional EGM generates a display which is viewed via a remote TV screen. It requires more bandwidth than the distributed architecture as all picture information is generated at the server and sent in a low level, high bandwidth form to the user interface. A low bandwidth communication channel is required to pass user input back to the server.

4. Hand held architecture. The secure functions of the EGM are implemented in a smartcard and all other functions in the unsecured console. The hand held architecture implements the secure functions within a smartcard. Limited storage capacity on the smartcard requires storage of graphics and combinations on the console for maximum flexibility. Variations on the storage location depend on the requirements (jurisdictional and otherwise). The smartcard may implement fixed combination(s) or download secured (encrypted or digitally signed) combinations from the console. When smartcard storage capacity is sufficiently large the smartcard may store graphics and audio for download to the console.

Table 1 shows the variety of platforms that may be implemented with these 4 fundamental gaming architectures.

**Table 1 Gaming applications and architectures**

Platform	Architecture			
	Traditional	Distributed	TV	Hand held
EGM	•	•		•
Hotel In-room		•		•
In-flight		•		•
On Ship	•	•	•	•
Internet		•		•
Cable TV		•	•	
Hand held				•

#### **Split-Software Architecture**

Referring to Figure 1, Split-software architecture has been previously proposed to allow games to be run independently of changes in the hardware platform. Further, the use of interpreted code allows games to be run on different microprocessors.

The split software architecture divides the gaming machine software into its two major elements. The game software contains all that software that is different between games, while the platform software contains the software that is common. In the traditional gaming machine software game software refers to the entire gaming machine software, while in the split software architecture game software game refers to that software that is different between "games". The exact meaning of game is therefore context

dependent. Typically game code includes graphics and sound data and combinations, while platform code includes all hardware drivers, kernel, accounting, security, operator interface, communications, etc.

5 In principal the two separate parts of the game can be approved independently, so that:

the platform EPROM is examined and approved only when it is changed and is tested with only a small subset of the possible games it will actually be used with. Hardware changes can be made to the platform with software changes limited to the platform. Games need not be re-approved.

10 The game EPROM is examined and approved without considering the version of the platform it will be used with.

Platform upgrades are feasible as only a single EPROM(s) need be submitted (for each market) to allow all games to run.

#### **Summary of the Invention**

15 The present invention provides a gaming console architecture including a game platform interface and a game program, the game program including a plurality of functional modules which interact via the platform interface.

20 In one preferred embodiment, the game program includes a user interface module and a combinations module and communication of combinations to be displayed, are conveyed from the combinations module to the user interface module via the platform interface.

#### **Brief Description of the Drawings**

25 Embodiments of the invention will now be described, by way of example with reference to the accompanying drawings in which:

Figure 1 diagrammatically illustrates a Split-Software Architecture;

Figure 2 diagrammatically illustrates in greater detail the upper layers of the Split-software of Figure 1;

30 Figure 3 diagrammatically illustrates a variation in the upper layers of a Split-software architecture to provide a Multi-platform architecture in an EGM according to an embodiment of the present invention;

Figure 4 diagrammatically illustrates a variation in the arrangement of Figure 3 which is used in a Multi-platform Distributed Architecture;

35 Figure 5 diagrammatically illustrates a variation in the arrangement of Figure 3 which is used in a Multi-platform Standalone EGM;

Figure 6 diagrammatically illustrates Multi-platform Distributed Gaming System incorporating a number of different platforms; and

Figure 7 schematically illustrates the interconnection of a Game Server to the various components of a Multi-platform system.

#### 5 **Detailed Description of the Preferred Embodiments**

In a multi-platform architecture, according to a preferred embodiment of the present invention, the game software is split into separate functions, such that the functions can be distributed to, and run on, each of the platforms for which it is required that the game support.

10 After removing the platform code, what remains of a traditional monolithic game is principally the combinations and graphics/audio. By splitting the game software into separate combinations and graphics/audio code which always interact with each other via the platform, the game can be run on a wide range of platforms.

15 A single software architecture is described below which is capable of supporting these diverse platform requirements. In principal an approved game can be run on each of the platforms without modification, and approval of the game on one platform is sufficient for approval on all platforms.

20 In the split software architecture the traditional monolithic game (comprising the two major functions of combinations and graphics/audio) is split into two separate pieces, the game and platform code, as shown in Figure 2.

The four traditional gaming architectures described differ in where each of these functions of the game is stored and executed. In a traditional  
25 EGM both functions are stored and executed within the EGM. In a distributed system the server stores the entire game, but executes only the combinations, while the console executes the downloaded graphics and audio. The distributed gaming accelerator system stores games on the secure server, executes combinations on both server and console, and  
30 graphics/audio on the user console. In the handheld system the entire game may be stored either on the console or smartcard or split between them depending on implementation, but combinations are executed on the smartcard and graphics/audio on the console. The TV system is identical in this respect to a traditional EGM, but the graphics are viewed on the remote  
35 TV.

Traditional game software is compatible only with the architecture and hence platform for which it was designed. It cannot run on multiple platforms, as the components of the game are either monolithic (as in an EGM) or separated (as in a distributed system).

5       The multi-platform architecture is essentially an extension to the split software architecture (see Figure 2).

The two functions of the game, combinations and graphics/audio are separable, with the combinations being secured (through encryption or digital signature) to prevent tampering. The separation between the  
10       functions requires that the game API layer mediate communications between the functions.

When the game is run the game code is separated, as required by the platform architecture, into the appropriate functions and downloaded (where necessary) to the appropriate part of the platform Figure 3 shows how the  
15       architecture is implemented in a traditional EGM.

Each of the separate game functions (eg. combinations, graphics/audio) may need to be secured to prevent tampering. If the function may be downloaded over an unsecured communication channel then the possibility of tampering exists. The consequences of tampering with  
20       combinations are particularly severe as it allows the payout of the game to be changed. Encrypting the data or creating a digital signature provides security. Additionally encryption hides the data, while a digital signature is probably quicker to authenticate.

In the distributed system the entire game is initially stored on the  
25       server. When the player requests a game, it is separated and graphics/audio are downloaded to the console and combinations are kept in the server. The same game in a traditional EGM is simply stored and executed unchanged. Figure 4 shows a distributed system with one server containing 'N' games and controlling 'M' consoles. Clearly more than one server may be used.

30       Platform code is that software required to support a game (or part of a game), on a particular platform. It performs the separation and distribution of game functions to those platforms for which it is required and provides communications where needed. Platform code exists for each platform within the gaming system and is in principal approved once for all games. A  
35       traditional EGM will have platform code for the EGM, while a distributed gaming system will have distinctly different platform code for the server and



console(s). In practice platform code will typically contain code to recognize player inputs (push-buttons, handle, touch-screen, etc), drive player outputs (video, stepper reels, audio, etc) and drive machine accessories (printer, hopper, note-validator, security, etc). Depending on system implementation  
 5 the system communications code may also be considered part of the platform code, but has been drawn separately in the illustrations to aid in understanding the systems.

Figure 5 shows an example implementation of a standalone EGM using the multi-platform architecture and shows the separate game and  
 10 platform approvals.

Figure 6 shows a distributed gaming system comprising of a server, distributed EGM, standalone EGM and in-room gaming console. The architecture of distributed and in-room gaming EGM is essentially the same, with the main differences being in payment systems and physical design.  
 15 Separate approvals are required for games (#1), server (#2), distributed EGM (#3), in-room EGM (#4) and standalone (#5) platform code. The standalone EGM may be monitored by and have games downloaded from the server.

In a casino standalone EGM's are often connected to networks to allow monitoring and simple control. These networks can be extended to perform  
 20 similar functions over the systems described, with, for example, distributed EGM's or the server itself being connected to these traditional networks. For compatibility the distributed EGM may emulate a traditional EGM. Alternately the network monitoring system may either be upgraded to understand the server or the server may emulate the appropriate number of  
 25 standalone EGM's. Clearly both options may be implemented simultaneously.

In an extension to the architecture, the game may contain multiple graphic/audio and combination files, only one of which is used to play a particular game. One useful application is where various target platforms  
 30 have different screen resolutions. Multiple graphics allow the best possible picture to be displayed. Where the target platform has only a very simple non-graphic interface one of the graphics files may cater for this. Different graphics may also allow the player to select their choice of "game". Different combinations cater for different player preferences, for example high win  
 35 rates or large win values.

Partial replacements of the combinations and/or graphics/audio files allow the game to be partially modified, thus decreasing the storage requirements compared to storing complete copies of each possible games variation. For example, if a game is created that may be used with 50  
5 different currencies a single main set of game graphics can be stored together with 49 different currency symbols. The total storage is far less than if 50 entire sets of game graphics were to be stored. Even worse, if 3 different symbols were to be selected, each from 50 possible, then the total number of variations is 125000 ( $50 \times 50 \times 50$ ). Similarly audio and combinations may be  
10 partially replaced by equivalent data.

The multi-platform architecture is easily extended if other aspects of a game are created or new platforms developed which require other functions of a game to run on one platform, but not another. In this way the multi-platform architecture can support a diverse range of platforms with a single  
15 game. The multi-platform architecture may be used in conjunction with interpreted code to achieve CPU independence on all platforms.

The architecture enables the creation of a generic "game server". The game server stores games for execution and distribution to the various platforms, as shown in Figure 7. The game server may therefore be used to  
20 distribute games to traditional EGMs, Internet consoles, televisions, etc.

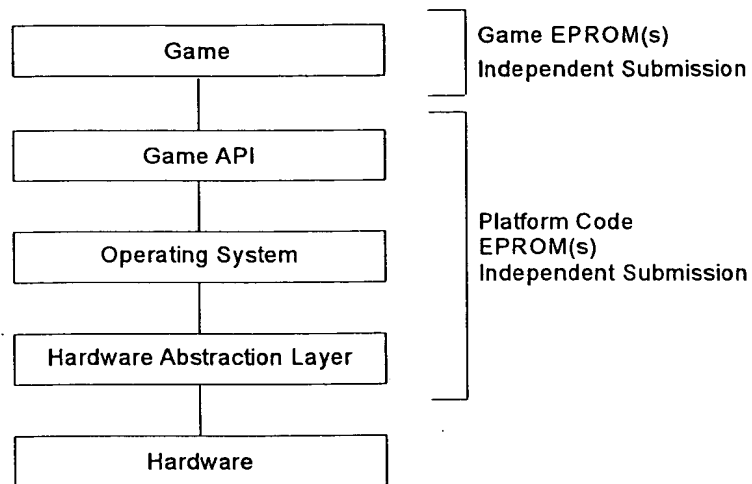
It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to  
25 be considered in all respects as illustrative and not restrictive.

Dated this twenty-seventh day of January 1998

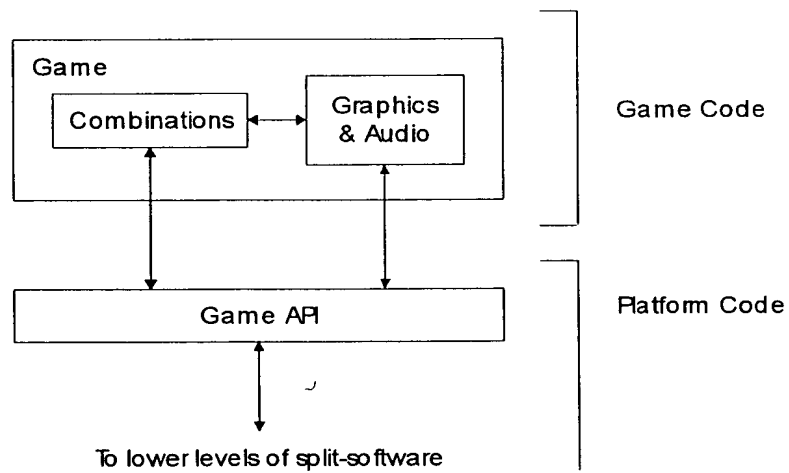
ARISTOCRAT LEISURE INDUSTRIES  
PTY LTD

Patent Attorneys for the Applicant:

F B RICE & CO



**Figure 1**



**Figure 2**

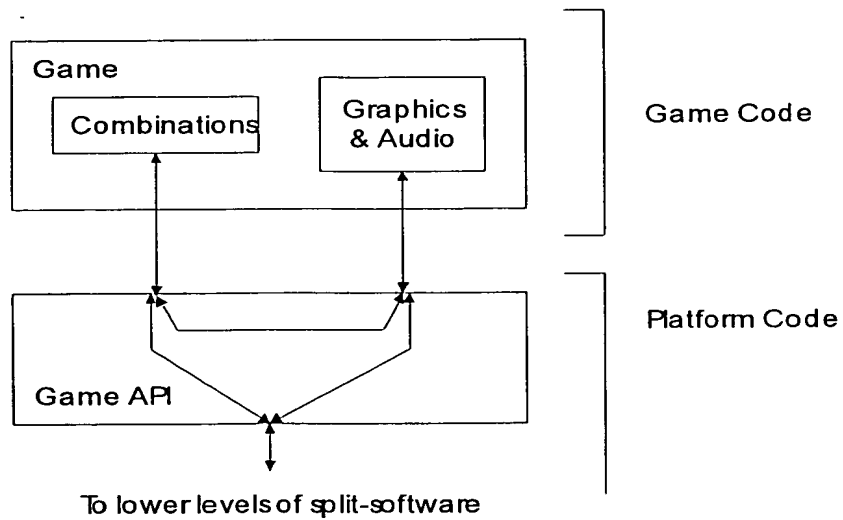


Figure 3

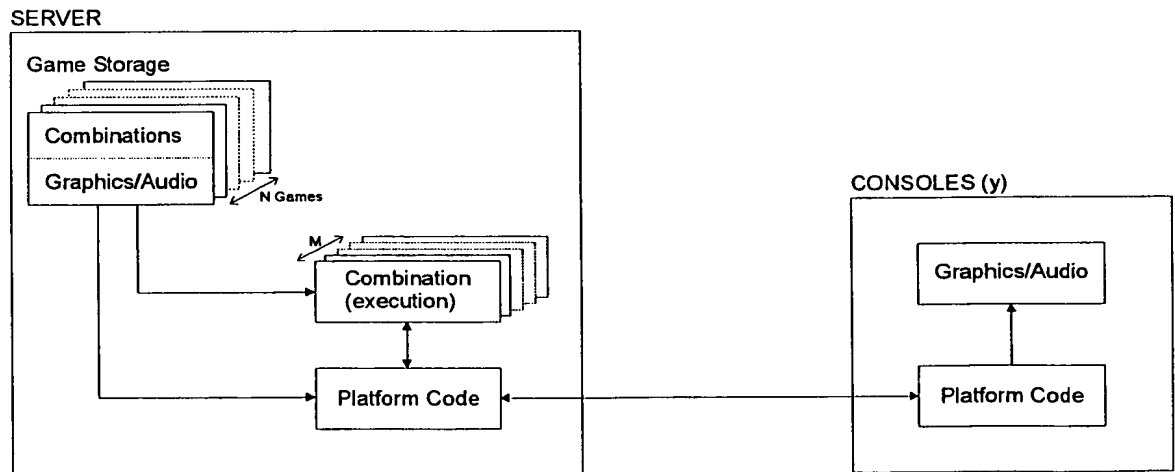
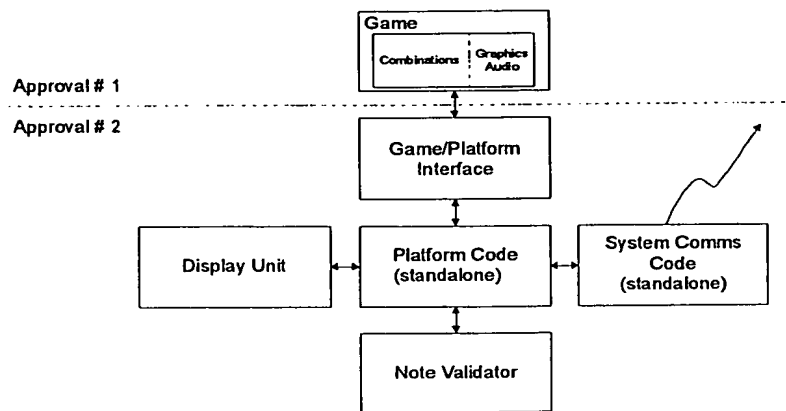
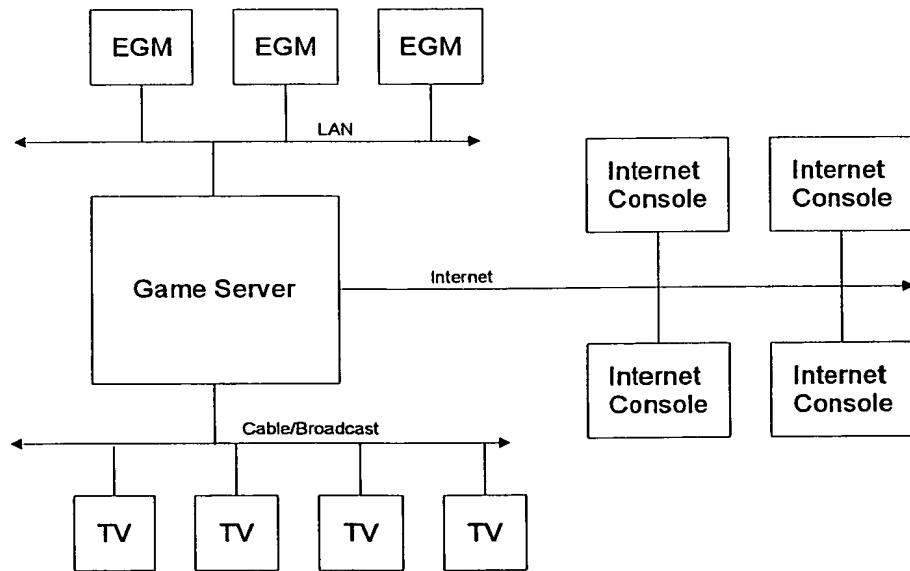


Figure 4



**Figure 5**



**Figure 7**

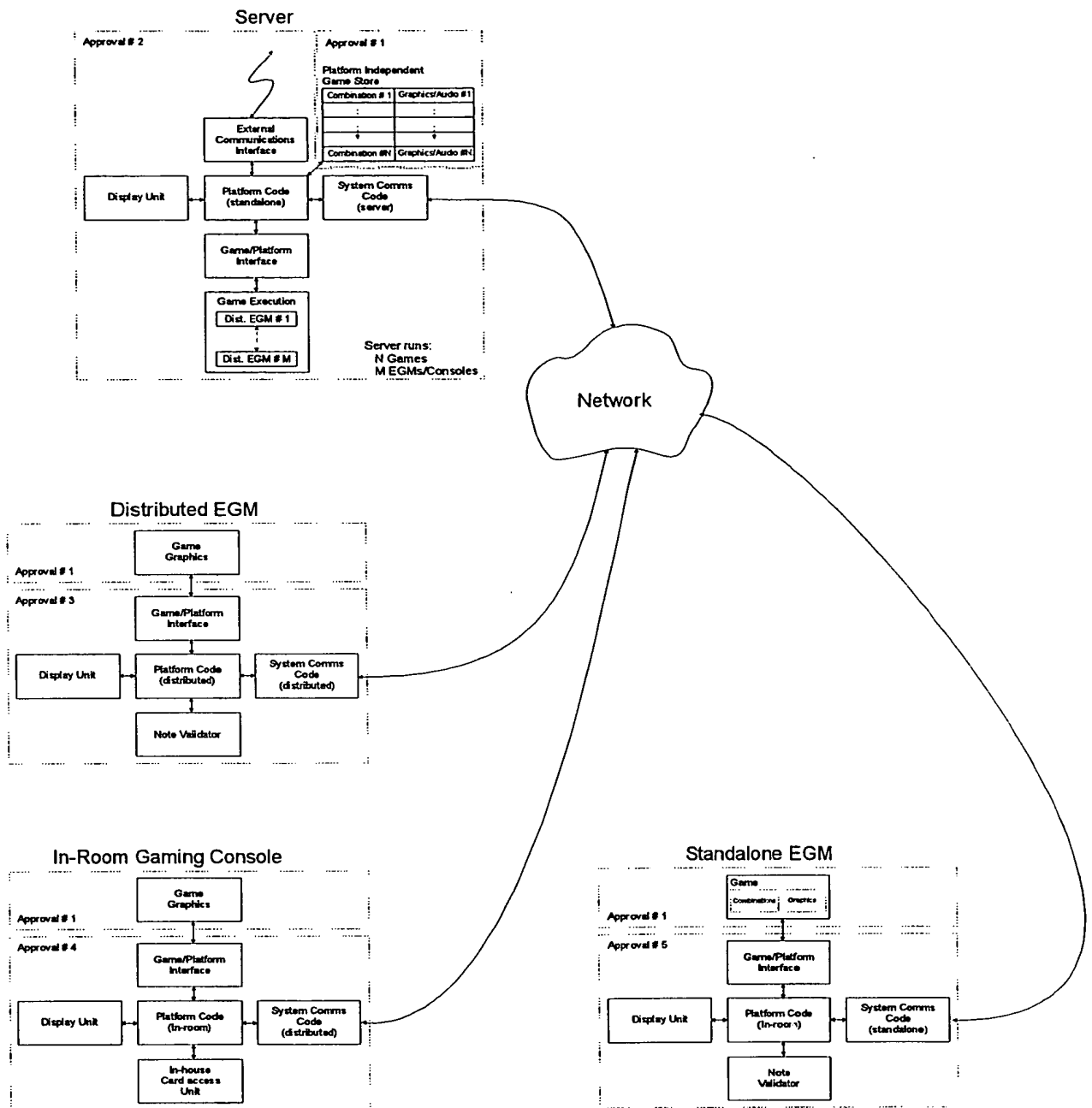


Figure 6